AN UNDESCRIBED CONCEALER MOTH, *STATHMOPODA* SP. (LEPIDOPTERA: OECOPHORIDAE) IN NESTS OF THE WEAVER ANT *POLYRHACHIS AUSTRALIS* MAYR (HYMENOPTERA: FORMICIDAE)

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Abstract

A concealer moth, genus *Stathmopoda* Herrich-Schäffer, 1853, closely resembling one known from Hervey Bay, Queensland and Coonabarabran, New South Wales but as yet undescribed, was found in nests of the weaver ant *Polyrhachis australis* Mayr, 1870 in Townsville, Queensland. The weaver ant nests provide the moth larvae with shelter and perhaps food in the form of dead leaves and/or the brood of the host ants. What deters the ants from attacking the moth larvae is unknown, as is the mechanism allowing the eclosed adult moths to exit the ants' nests unharmed.

Introduction

Concealer moths, family Oecophoridae, are named for the tendency of the larvae to 'hide' in silk shelters, often in the curls of rolled foliage. Unsurprisingly, what is known about the biology of the Australian fauna is limited and fragmentary but, while their feeding habits centre in the main on plant (especially dead plant) material, a number of records exist of these moths exploiting the adults and brood of other arthropods (Common 1990). The taxonomy, meanwhile, saw its last revision 70 to 80 years ago (Turner 1932-1947), with no realistic prospect of another in the foreseeable future; hence many specimens, including the one documented here, await a specific description and a name.

Discussion

Eight adults of the undescribed concealer moth were reared from pupae collected in Cranbrook, Townsville (19.30°S, 146.75°E), the first in June 2013 and the eighth in April 2014. Three originated from a clump of rotting plant debris wedged in a palm thicket (Fig. 1). Five others came from within two nests of the weaver ant *Polyrhachis australis* Mayr, 1870, a colony of which had long been established among these palms and the surrounding vegetation (Fig. 2). A ninth adult moth came from a *P. australis* nest collected in Mundingburra, Townsville (19.30°S, 146.79°E).

In these weaver ant nests, the moth larvae sheltered in narrow silk tunnels aligned along one of the nest margins, typically where the edge of a living or dead supporting leaf was curled along its long axis.

In all but one of the nine cases, larvae were present in addition to the pupae that produced adults. Because other moth species occurred in the same habitat, no unequivocal full sequence of larval instars, pupa and adult was established. However, over a five year period of investigation of more than

400 nests of *P. australis* at this location (Downes 2015), more than 30 matching larvae (Figs 3-4) and more than 40 matching pupae (Figs 5-6) were observed and/or collected from 23 nests, covering all months except May.

Sometimes the larvae most suspected of being those of the concealer moth occurred together with empty pupal cases of the adult. Larvae smaller than the suspected second instar illustrated in Fig. 3 were observed among the ants' eggs on one occasion, but whether these were first instar larvae of this moth cannot reliably be gauged. The material available suggests a sequence of four larval instars that carry out their feeding tasks and complete their development in the presence of the ants. How they accomplish this is unknown, as is the mechanism that allows the eclosed adult moth to depart the nest unharmed. Some adult butterflies, *e.g. Liphyra brassolis* Westwood, escape from inside the nests of aggressive host ants by shedding wing and body scales (Dodd 1902) but this tactic is unlikely to apply in this case.

The smooth body scales of the adults (Figs 7-8) give the moth a shiny gold hue. The wings are golden yellow anteriorly and dark to black posteriorly, heavily fringed along their trailing edges. They were found to closely resemble (but not match identically) undescribed specimens of the genus *Stathmopoda* Herrich-Schäffer, 1853, now in the Australian National Insect Collection, which were obtained by Ian Common at Pialba (Hervey Bay), Queensland and Coonabarabran, New South Wales, the former reared from dead leaf litter and the latter collected at light.

It could be inferred from this that the larvae feed on dead plant material, as do the majority of oecophorids (Common 1990); this could also apply to the larvae developing in the weaver ant nests. Alternatively, or in addition, the larvae could be preying on the ants' brood. It would not be the first gelechioid moth to be found to subsist on arthropod brood (Austin 1977), nor the first *Stathmopoda* sp. to do so (Downes 1994), nor even the first moth predatory on ant larvae (Narukawa *et al.* 2002).

The circumstances under which specimens were obtained, especially the extraction of larvae and pupae from rotting plant matter, all but preclude an obligate association of the moth with the weaver ants but, in this connection, it is worth noting that the clump of decomposing plant substance had a bivouac of ants, *Technomyrmex* sp., at its core. Voucher specimens (three adult moths) have been deposited in the Australian National Insect Collection, Canberra.

Figs 1-8. (1-2) Moth pupal cases and their silk shelters: (1) among plant debris; (2) among silk and carton of one of the weaver ant nests. (3-4) Moth larvae and pupae: (3) larva believed to be the second instar of the concealer moth, x15; (4) suspected second (lower), third (middle) and fourth (upper) instar larvae, x3. (5-6) Moth pupae**:** (5) ventral aspect of pupa, x10; (6) lateral aspect of pupa, x10. (7-8) Reared adult moths: (7) dorsolateral aspect before setting, x8; (8) set and spread, x7.


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